

\* To Examiners Reference \*

**Patent Claims**

1. A method of monitoring the quality of lubricant that is in a gear mechanism or machine and that contains effective materials, said method including the steps of:

5 withdrawing from the gear mechanism or machine a sample of said lubricant or of vapor that escapes from said lubricant,

conveying a sample of the vapor escaping from the lubricant to an ion mobility spectrometer,

10 analyzing materials of said sample that are present in a vapor phase above said lubricant, and

comparing a change of content and type of analyzed materials in said sample to predetermined materials in a vapor phase of virgin lubricant, and using such comparison as an actual condition 15 for an aging of said lubricant.

2. A method according to claim 1, wherein the lubricant is classified pursuant to the analysis of the determined measurement results by comparison with prescribed threshold values.

3. A method according to claim 1, wherein after the analysis 20 of the determined measurement results by comparison with prescribed threshold values, effective materials are added to the lubricant.

4. A method according to claim 1, wherein after the analysis of the determined measurement results by comparison with prescribed threshold values, the lubricant is exchanged.

5. An apparatus for monitoring the quality of lubricant that is in a gear mechanism or machine and that contains effective materials, said apparatus comprising

a sample withdrawal line (3) connected to said gear mechanism or machine,

10 an ion mobility spectrometer (5) connected to said sample withdrawal line (3), and

an analysis unit (14) connected to said ion mobility spectrometer (5).

6. An apparatus according to claim 5, wherein said analysis unit (14) is connected to a control room (16)

15 7. An apparatus according to claim 5, wherein said analysis unit (14) is connected to a remote monitoring station (18).

8. An apparatus according to claim 5, wherein said sample withdrawal line (3) is connected to an inner chamber of said gear mechanism or machine above a level of said lubricant therein.

20 9. An apparatus according to claim 5, wherein said gear mechanism or machine is provided with an oil-venting device (4) and

wherein said sample withdrawal line (3) is connected to said oil-venting device (4)